URSI: The International Scientific Radio Union*

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Summary—**The International Scientific Radio Union originated in a small meeting in Brussels in 1913; thus, it was celebrating its Golden Jubilee, or 50th anniversary, at its XIVth General Assembly in Tokyo in September, 1963. The following paper presents a very brief history of the URSI, with an account of its scientific objectives and its activities in relation to other scientific and technical bodies in the radio and allied fields. For a comprehensive account of the development and international work of the URSI, the reader may be referred to a volume shortly to be published.[1]**

AT ITS GENERAL ASSEMBLY held in Tokyo in September, 1963, the International Scientific Radio Union, generally known as the URSI after the initial letters of the title in French, was celebrating the fiftieth anniversary of its existence. It was at a meeting in Brussels on October 13, 1913, that nine scientists from six European countries founded what was then called an "International Commission on Wireless Telegraphy," and drew up a preliminary program of research covering the measurement and control of the frequency of transmitting stations, the study of the fluctuation of received signals over various distances at all times of the day and night, and the simultaneous measurement of atmospheric disturbances at different stations. The first officers elected were W. Duddell (London) and M. Wien (Vienna) as President and Vice-President respectively, while Dr. R. Goldschmidt (Brussels), the enthusiastic organizer of the meeting, was appointed Secretary-General.

After a further meeting, also in Brussels, in April, 1914, attended by some 16 scientists from six European countries, the development of this international organization was interrupted by the First World War.

Formation of URSI—1919

Following the cessation of hostilities, some members of the above International Commission realized that the great progress in the development of radio communication and direction finding during the war period had increased the desirability for international cooperation in scientific research. They decided to change the name of the Commission to "International Union of Scientific Radiotelegraphy" which a few years later was modified to the present title of "International Scientific Radio Union."

The year 1919 saw the formation of an International Research Council, which was renamed in 1931 the International Council of Scientific Unions (ICSU); this Council is the parent body of 15 International Scientific Unions of which URSI was one of the first four to be organized, in 1919. The others are the corresponding Unions of Astronomy, of Geodesy and Geophysics, and of Pure and Applied Chemistry. These and the other Unions under ICSU, once their statutes have been approved, are free to manage their own affairs, reporting periodically to the parent body (ICSU) which acts in an advisory capacity and provides liaison with UNESCO, the United Nations organization.

The members of an international scientific union, such as URSI, are not individual persons but the various national bodies or academies, usually and desirably nongovernmental, responsible for encouraging and sponsoring scientific research in the different countries. For the purpose of dealing with the formal business procedure and conducting the collaboration in the various fields of scientific research, national committees are formed, and these, in effect, constitute the membership of the international unions. In 1963, there are 51 countries adhering to ICSU, and of these 28 are active members of URSI.

The aims of URSI may be summarized as follows: 1) to promote international cooperation in the scientific study of all aspects of radio; 2) to encourage and help in the organization of radio research requiring cooperation on a large scale; 3) to promote the development and establishment of common methods and standards of measurements at radio frequencies; 4) to encourage the publication, discussion and dissemination of the results of these activities; and 5) to collaborate as may be desirable with other international scientific and technical bodies in the development and application of radio for the general benefit of mankind.

General Assemblies 1922–1963

The above objectives are pursued first at national levels by the appropriate scientific academy or institution, and then, at approximately three-year intervals, by the holding of international General Assemblies at which progress in the various fields of scientific radio is reviewed, and plans are drawn up for the future. The first such General Assembly was held in Brussels in 1922 under the presidency of General Ferrié of France; the next twelve assemblies were held in various towns in Europe, the United States of America and in Australia, and the latest one was held in Tokyo from September 9–20, 1963.

During this active life of the URSI, the following have held the office of President of the Union for the periods stated:

General Ferrié (France)	1919–1932
Doctor L. W. Austin (U.S.A.)	1932

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[1] "URSI Golden Jubilee Memorial: 50 years of Radio Science," Elsevier Publishing Co., New York, N. Y.; 1963.

Professor A. E. Kennelly (U.S.A.)	1932–1934
Sir Edward Appleton (United Kingdom)	1934–1952
Father P. Lejay (France)	1952–1957
Doctor L. V. Berkner (U.S.A.)	1957–1960
Doctor R. L. Smith-Rose (United Kingdom)	1960–1963
Professor I. Koga (Japan)	1963–present.

At these General Assemblies, the work of the Union is conducted through a number of commissions, each with its own chairman and responsibility for a portion of the field of scientific research in radio. At the closing meeting of each Assembly, the chairmen present reports on the activities of their commissions with any recommendations or resolutions arrived at, together with proposals for the future program of research requiring international cooperation.

The Commissions and Their Programs for 1963

At the General Assembly in Tokyo the commissions arranged programs of scientific sessions, at each of which an introductory speaker of international repute reviewed progress in a portion of the field of scientific radio selected for general discussion. Commission I dealt with precision measurements with particular reference to atomic and molecular standards of frequency and time, and to the application of radio techniques to the measurement of physical constants. The second and third commissions were concerned with the propagation of radio waves through the troposphere and ionosphere respectively, and the effect of meteorological, solar and magnetic phenomena on such propagation. Commission IV reviewed the current state of knowledge on atmospheric noise all over the world, and the phenomena associated with such noise at various parts of the radio frequency spectrum. "Radio Astronomy" is the title of Commission V, and its program dealt not only with solar astronomy but also with advances in the study of both discrete and galactic sources and with the observational techniques and measurements involved in such studies. The scope of Commission VI covered various aspects of both electromagnetic and information theory in its relation to the science of radio. Commission VII, by no means the last in order of the importance of its work, dealt with both the physics and applications of masers and lasers, as well as with plasmas on a geophysical and astrophysical scale, and with the modern devices being developed and used for communication with man-made satellites.

In addition to the above, the program provided for two special sessions which were of interest to most of the participants in the individual commissions. One of these sessions dealt with advance in space communications and with the application of instrumented satellites to the exploration of the ionosphere and space beyond. The second was concerned with the final stages of preparation for the world-wide study of geophysical phenomena during the forthcoming International Years of the Quiet Sun (1964–1965). The program of the IQSY, as it is termed, is a successor to the operations conducted during the International Geophysical Year of 1957–1958, during which the URSI collaborated with other international Scientific Unions to conduct a large-scale coordinated study of geophysical phenomena, including their causes and effects.

Relationship between the URSI and Other International Organizations

Close and harmonious relationships exist between the URSI and other international organizations interested in similar or adjacent fields of study. Some of these, such as the Astronomical Union (IAU), the Union of Geodesy and Geophysics (UGGI) and, more recently, the Committee on Space Research (COSPAR), are organized under the same international council, the ICSU. There is also close relationship between the URSI and the CCIR—the International Radio Consultative Committee—which, as a technical advisory body of the International Telecommunication Union (ITU), is directly concerned with all advances in radio knowledge and technique and their application to the efficient conduct of the constantly expanding field of radio communication, including such applications as radar, navigation, and sound and television broadcasting. Such cooperation is assured by having representatives of each organization participating in the meetings or assemblies of the other related bodies.

As a recent example of the importance and effectiveness of such cooperation, this review may close with a brief reference to the allocation of parts of the radio frequency spectrum to meet the needs of scientists engaged in radio astronomy or space research. At the 1959 conference of the ITU in Geneva, the provision of specific allocations in the frequency spectrum for both radio astronomy and space research was only partially achieved. At the XIIIth General Assembly of the URSI in London in 1960, an Inter-Union Committee was set up with equal membership from the three interested scientific bodies, URSI, IAU and COSPAR, with representatives from the ITU and its International Frequency Registration Board. Dr. J. F. Denisse (Observatoire de Paris) is the Chairman, and the writer is the Secretary-General, of this Inter-Union Committee on the Allocation of Frequencies for Radio Astronomy and Space Science—its full title—which has studied the requirements of the astronomers and space scientists, and has collaborated with the CCIR to ensure that the whole subject of the protection of the desired radio frequencies was considered by the Extra-Ordinary Administrative Radio Conference held at Geneva in October, 1963. It is hoped that, in this way, the cooperative action taken by the interested scientific organizations will secure an equitable allocation of the frequencies required for the conduct of the important fields of research in radio astronomy and space science.